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10/523,101

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Liliana Bagala' Rampazzo

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04/17/2008

CONNOLLY BOVE LODGE & HUTZ, LLP

P O BOX 2207

WILMINGTON, DE 19899

EXAMINER

NELSON, MICHAEL E

ART UNIT

PAPER NUMBER

1794

MAIL DATE

DELIVERY MODE

04/17/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

DETAILED ACTION

1. In response to Applicant's response dated 04/07/2008, claims 1-21, 25-26, and 28-29 are pending.

Response to Amendment

2. Claims 13, 16 and 17 have been amended to overcome objections raised in the final office action concerning formal matters. The objections to those claims have been withdrawn in light of the amendments.

3. The affidavit under 37 CFR 1.132 filed 01/31/2008 is sufficient to overcome the rejection of claims 13-14, 16-17 based upon the showing of unexpected results with respect to compounds of the prior art.

Response to Arguments

4. Applicant's arguments filed 04/07/2008 have been fully considered but they are not persuasive.

5. Applicant argues on page 8-9 that the references of the prior art do not teach the compounds claimed. Lupo et al. discloses the synthesis of acylated spirobifluorene compounds by Friedel-Crafts acylation reactions. Applicant affirms that the Friedel-Crafts acylation reaction is well known in the art, and has been for several decades. Towle et al. simply discloses that it is also well known in the art to use aroyl halide compounds in the Friedel-Crafts acylation reaction, and as such it would have been obvious to one of ordinary skill in the art to perform the same chemistry described by

Lupo et al. using benzoyl (aroyl) halides as precursors, leading inevitably to the compounds of the current invention. Therefore the *prima facie* case was established.

6. Applicant has presented evidence by affidavit that the compounds of the current invention function better than the compounds described by Lupo et al., but provide only a single example for comparative purposes. Examiner asserts that the single example does not support the scope of the claims as filed, since many aromatic substituents, and substituted aromatic substituents are included in the scope of the present claims.

7. In response, Applicant argues on pages 9-11 potential reasons why **any** aromatic substituent would be expected to produce an improvement over the compounds in the prior art. Applicant advanced three **potential** reasons (mesomeric stabilization, steric shielding, and the absence of 'acidic' CH₃ groups), but does not provide any supporting evidence or references.

8. Concerning mesomeric stabilization, Applicant has supplied structural formulae to support the assertion that the additional aromatic ring provided by the aryl substituent provides additional stabilization. However, the structures are fundamentally flawed (5 bonds on carbon, etc), and so do not present a clear argument. Highly conjugated compounds are known to form more stable radical species. However, the scope of the claims includes many heteroaromatic rings in addition to hydrocarbon ring systems. The additional electrons in the aromatic systems due to the heteroatoms would tend to disfavor the addition of electrons into molecules, and furthermore lead to other

heteroatoms where free radicals may become localized, resulting in secondary reactivity, ring cleavage, and potential degradation of the molecules by radical processes. Furthermore, highly electron donating substituents likewise discourage radical stabilization.

9. Concerning steric shielding. Increased steric shielding would be predicted to have negative effects. Applicant recognizes that the radical is likely to reside in the vicinity of the electronegative oxygen atom. The more shielded the atom, the less likely that two adjacent or nearby compound would come into contact with each other sufficiently to transfer the radical from one molecule to another, resulting in an increase in driving voltage as more energy must be pumped into the system to expose the reactive centers of the compound. As such, very large substituents would be expected to be detrimental.

10. Concerning "acidic" CH₃ groups. The hydrogen atoms adjacent to a carbonyl are extractable under radical conditions, resulting in radical reductions and other chemistry assuming they come into proximity to the radical center of an adjacent radical bearing species, since intramolecular hydrogen abstraction is unlikely in this case. However, other substituents within the scope of the claims are much more prone to hydrogen extraction by radicals including hydrogens on Nitrogen, oxygen, sulfur, or benzylic hydrogens, as well as hydrogens on acidic heterocycles.

11. Applicant clearly states that one or more of the argument **might** apply. However, no argument provides support for the full scope of the claims, since compounds within the scope of the claims would be expected to have negative effects based on each

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potential argument. Absent additional supporting evidence to support an assertion more commensurate with the scope of the claims as written, the broad scope of the claims cannot be supported by a single example.

12. It is noted that “the arguments of counsel cannot take the place of evidence in the record”, *In re Schulze*, 346 F.2d 600, 602, 145 USPQ 716, 718 (CCPA 1965). It is the examiner’s position that the arguments provided by the applicant regarding potential reasons why **any** aromatic substituent might predictably function to stabilize a spirobifluorene radical anion, compared with an acetyl substituent must be supported by a declaration or affidavit. As set forth in MPEP 716.02(g), “the reason for requiring evidence in a declaration or affidavit form is to obtain the assurances that any statements or representations made are correct, as provided by 35 U.S.C. 24 and 18 U.S.C. 1001”.

Allowable Subject Matter

13. Claims 13-14, and 16-17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims which are likewise dependent from those claims would also be allowable. After further consideration, claim 7, with the limitation where A is simply an “aromatic” group will not be included in the allowable subject matter.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL E. NELSON whose telephone number is (571)270-3453. The examiner can normally be reached on M-F 7:30am-5:00pm EST (First Friday Off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Callie Shosho can be reached on 571-272-1123. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Michael E. Nelson
Examiner
Art Unit 1794

/Callie E. Shosho/

Supervisory Patent Examiner, Art Unit 1794

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